



## Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

other attempts to establish a communication with this interesting part of the world.

This journey having been solely of a mercantile character, has added little to science; but we trust that the speedy publication of the proceedings of the former extensive expedition may put us in full possession of much valuable information. It is to be regretted that any delay has taken place, especially since the labours of the naval officer, who accompanied the expedition solely for scientific purposes, must, together with his survey of the river, prove extremely valuable.

VI.—*Expedition organized by the Imperial Academy of Sciences at St. Petersburg to determine the Difference of Level between the Black and the Caspian Seas.*

[M. Kupffer, of St. Petersburg, well known by his valuable magnetic and meteorological observations, and an active corresponding member of the Geographical Society, has kindly transmitted to us an account of an expedition which must excite great interest in every one anxious to advance our knowledge of the physical geography of the globe.]

It is well known that, in 1830, M. F. Parrot, jun., of Dorpat, in his journey to Mount Ararat, made a barometrical level by stations between Astrakhan and Novo-Tcherkask,\* in order to determine the difference of level which exists between the Black Sea and the Caspian, the result of which was found not to agree with the former measurements; and especially with those which had been found by two levels executed by the same M. Parrot, conjointly with Professor Engelhardt, between two other points of these seas, viz., Taman and Kisliar.† According to these results it was adopted as a fact, without doubt, that the Caspian Sea formed the lowest point of the vast basin which the western portion of Central Asia presents; and its depression was reckoned at near 300 feet. But the last survey of this skilful observer obliges us either to reject that opinion, or at least to doubt its exactness. It is not then surprising if a great number of those who have read

\* Novo-Tcherkask is about forty miles north-east of the mouth of the river Don, where it falls into the sea of Azov. Astrakhan is about twenty-five miles from the Caspian Sea, at the mouth of the river Volga. The direct distance between these two places is 340 geographical miles nearly.

† Taman, on a small island of the same name, forms the south-eastern point of the Strait of Enikali, between the Crimea and the territory of the Cossacks of the Don, and near the mouth of the river Kuban. Kisliar is about thirty-five miles from the Caspian Sea, near the outlet of the river Terak. The direct distance from Taman to Kisliar is about 420 geographical miles.—ED.

M. Parrot's journey to Ararat, have shown a desire to see this question resolved by a trigonometrical survey; a desire also expressed by many members of the Academy, who would immediately have had recourse to the munificence of the Emperor for the accomplishment of the plan, if, at that period, they had been able to find persons sufficiently exercised in this description of observations, to execute the work with success, and disposed to surmount its difficulties, and to brave its fatigues.

At the commencement of this year, M. Struve announced to the Academy that three of his former pupils, for whose knowledge and zeal he would be responsible, would undertake the task if the Academy would confide it to them. These three observers are M. George Fuss, assistant astronomer at the central observatory of Poulkova; M. Sabler, assistant astronomer at Dorpat; and M. Savitch, a well-known mathematician at Moscow: the two last are about to fill professor's chairs. This announcement of M. Struve was warmly received by M. Parrot, sen., who had already proposed to his colleagues to join him in drawing up a project upon this subject. M. Parrot presented three papers to the Academy, in which are set forth in full detail the labours and method of proceeding required in such an undertaking. These preliminary works being taken as the basis of the discussions, Messrs. Parrot, Struve, and Lenz, have submitted to the Academy the outline of a scientific expedition, which will have for its objects—

1st. To determine, trigonometrically, the difference of level of two points, one upon the shores of the Black Sea, the other upon the Caspian.

2ndly. To establish, astronomically, the position of the two extreme points of the line of survey, as also of other intermediate and neighbouring points.

3rdly. To make barometrical observations, for the period of a year at least, with instruments compared with each other, and at corresponding hours, upon the shores of both seas, as also during the trigonometrical operations, along the whole line of survey.

The Academy approved and strenuously supported the undertaking in all its objects; and by its request, the Minister of Public Instruction, in concert with the Minister of Finance, laid the project before the Emperor, who, on the 24th of May, granted his sanction, and placed the sum of 50,000 roubles at the disposal of the Academy to meet the expenses of this important expedition.

The Academy have, in consequence, laid down the following plan of operations:—

In order to attain with certainty the principal object of the levelling, it is necessary, in the first instance, to fix a line upon

which it is to proceed. From information furnished for the purpose by Messrs. Parrot, jun., and Engelhardt, who, from having traversed the country in every direction, are fully acquainted with it, preference has been given to the line which joins Novo-Tcherkask with Stavropol, and Stavropol with Kisliar.\* This line has the advantage over all others, of traversing a country which is known, inhabited, and offering few difficulties to the traveller : moreover, Novo-Tcherkask, as a starting point, can furnish the expedition with all necessary materials. The whole of this line will be formed by successive sights taken at about two versts (7000 feet English) from each other. The interval between each, and the zenith distance from each, taken from two neighbouring points of sight, will be measured, and from thence the height of one above the other obtained ; and by taking the sum of the results with their signs, + or —, we shall get the difference in the level of the two extreme points, the one on the Black Sea, and the other upon the Caspian.

The determination of the zenith distances does not present any difficulty, and will be taken by the usual method. The intervals will be obtained according to the proposition of M. Parrot ; that is to say, that from every second station, and consequently every four versts, instead of a station, a small base of some hundred feet will be carefully marked off perpendicularly to the line of operations. It is evident that, by connecting at each end these small bases with the neighbouring points of sight, a series of triangles will be obtained, whose short sides (perpendicular to the line of operation) will contain some hundred feet, and the greatest about two versts, and which will touch alternately by their apex and their base. As one side of each of these triangles is known, and the angles can be determined by a theodolite, the intervals of the point of sight will be thus obtained, and by these and the zenith distances the difference of their heights.

Two observers, provided with theodolites, would furnish two series of observations independent of each other, and which would respectively control each other. One of this series should be designated the northern, and the other the southern series.

The angles of azimuth will give at the same time the survey of the country across which the line of operations will pass : lastly, it will be easy to connect with the principal work the trigono-

---

\* The direct distance between Novo-Tcherkask and Stavropol is 175 geographical miles ; from Stavropol to Kisliar 215 miles ; making the whole distance along the proposed line of level 390 miles, on a general bearing of N.W. and S.E., or a diagonal line connecting two extreme points of the two former lines of levelling, which ran nearly parallel to each other in about an east and west direction, and at about 150 miles apart.—Ed,

metrical determination of the height, and the positions of the principal peaks of the chain of Caucasus, which will be visible along a great extent of the line of survey.

To ensure success as far as possible, the three observers will, with the instruments of the expedition, and under the direction of M. Struve, make a trial of levelling, upon an extent of about twenty versts. M. Massing will accompany the expedition as mechanic, to keep the instruments in order.

As to the barometrical observations, from the commencement of the work, two barometers provided with psychrometers will be sent to Taganrog, and to Astrakhan; M. Manne, school-director at the former, and M. Osse, a medical man at the latter, will be directed to observe them, and to note the changes several times a day during the time of the operations. The expedition will have three barometers, two of which, during the whole line of levelling, will be observed simultaneously wherever zenith distances shall be measured. These three barometers will serve also to compare the barometers fixed at Taganrog and Astrakhan, both at the beginning and the end of the operations, as also during the interruption in winter.

To ensure success, the duration of the expedition has been fixed at eighteen months; the members will leave St. Petersburg in the course of July, 1836; the trigonometrical operations will begin in the autumn, the most favourable season for this object, and will be suspended during the severe months of the winter, to be recommenced in the following spring.

The expedition will be furnished with the following instruments:—

A grand universal instrument by Ertel; horizontal circle twelve inches; vertical circle eight inches.

Two astronomical theodolites of eight inches, from Munich.

A small universal instrument; horizontal circle six inches; vertical circle four inches.

A transit instrument.

Seven mountain barometers, according to M. Parrot's construction; and spare tubes.

Two psychrometers.

Four chronometers.

Three compasses, &c. &c.

---

VII.—*Letter from Mr. Davidson to the Secretary of the Geographical Society, dated Wednoon, 22nd May, 1836.*

SIR,—Hitherto I have had nothing of sufficient interest, in a geographical point of view, to warrant me in troubling you with a